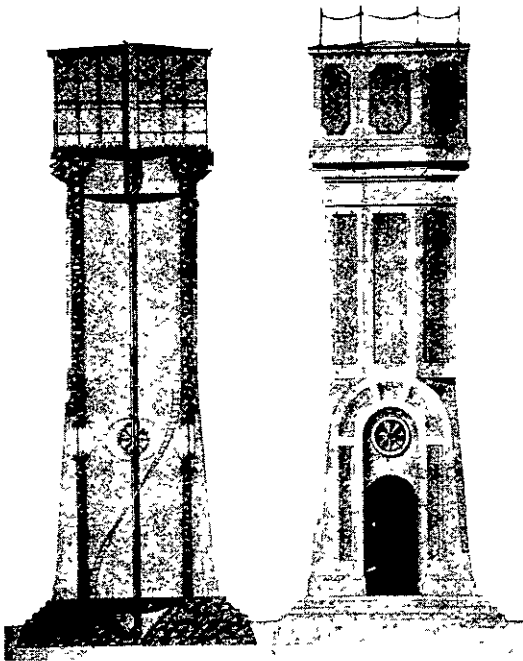


Addington Water Tower.

BUILT OF FERRO-CONCRETE NEARLY A QUARTER OF A CENTURY AGO.

Building in concrete and steel, known as ferro-concrete, is coming to the fore, and will receive a great impetus from the late sad disaster in California; but it is not generally known that the process is by no means new. We give herewith a print of the drawings of a water tower built in 1882 at the Addington workshops of the Government Railways. The tower was designed by Mr. Peter Ellis, then chief draughtsman of the railways, but now a draughtsman in the service of the Welling-



ADDINGTON WATER TOWER, BUILT OF FERRO-CONCRETE 25 YEARS AGO.

[From designs of Peter Ellis.]

ton Harbour Board, and the work was carried out by his brother, Mr. J. A. Ellis, of Christchurch, who was a foreman of works in the Government service at the time. The whole mass of the tower is of concrete and steel, built to an excellent design, and it stands as a unique work evidencing boldness and originality. At the time the work was proposed the Public Works Department would not entertain it, and the whole responsibility was cast on the designer; but the correctness of his judgment is seen in the splendid solidity of the work to-day, not a crack or fault being visible. Several tons of scrap steel were embedded in the concrete in layers at every foot of height, making a mass which would take a great force to disintegrate, and which of course improves in

solidity with time. The design was worked out so that the centre of gravity was very low, even with the tank full of water, i.e.: 23,000 gallons. A lurch from an earthquake or suchlike would have to be very severe to capsize it. The designer had in his mind the common child's toy, with lead at one end and cork at the other, that always turns upwards which ever way it is laid—a cardinal principle for statical bodies, and *vice versa* for tractional moving bodies, as in the bicycle. The design shows also a bold departure in the matter of foundations, as will be seen from the drawings. It extends a very short way below the surface of the ground, the reason for this being the fact that a considerable depth of quicksand was found about six feet below the surface, and instead of penetrating through the overlying clay stratum, the step was taken of just skinning off the upper loam and building direct on the layer of clay overlying the quicksand, and the designer informs us that he watched with keen interest the sinking of the tower as the weight of the building increased, until actually nine inches of settlement took place by the time it was completed, and his faith in its stability was upheld by the knowledge that the work, being balanced around its vertical centre, would settle equally, and finally rest safely. This demonstrated that quicksand or any other sand was a good material to build on, provided it cannot get away from beneath the structure. There is no doubt that a great future lies before ferro-concrete construction and the work mentioned is another instance of advanced ideas in the minds of thinkers, long before those ideas are accepted by the multitude; and there is hardly any work of modern times but has heretofore had a fore shadowing in the brain of some inventor.

New Bath House at Rotorua.

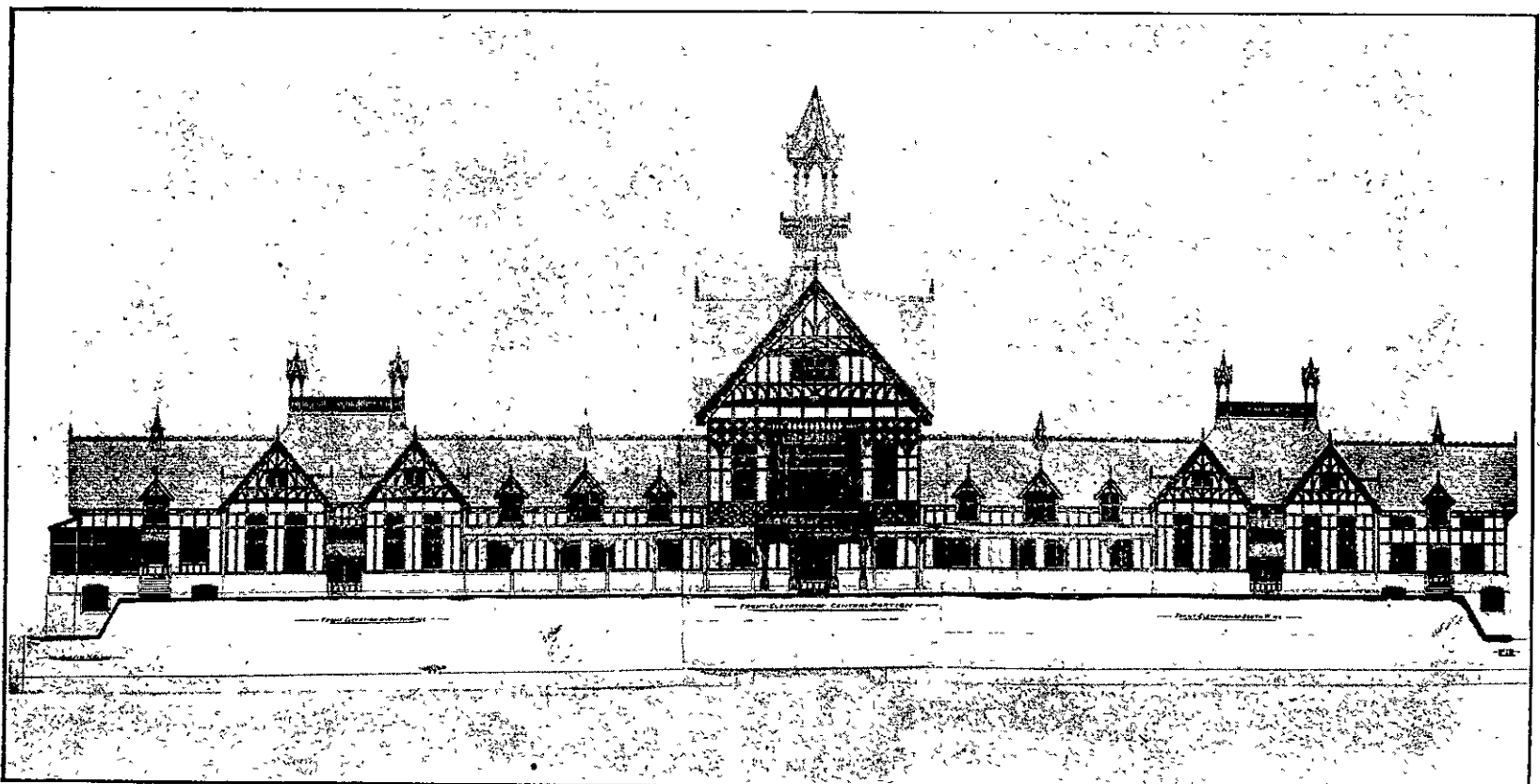
This fine structure, which is in course of erection, will be 320 ft. long, and, although apparently two-storied, it is mainly of only one floor. The building runs due north and south and faces west, so that every portion, except the short southerly aspect, has the sun during some time of the day. In the centre, over the entrance hall, the gabled roof contains two stories, and at the intersection of the central roofs is placed an octagonal tower, forming a lantern light to the central hall. An arrangement of double doors serves to prevent the westerly winds blowing straight into the building, and shuts out draught. The central hall rises straight to the roof, baring the open timbers. The floor throughout the building is tessellated. A gallery leads round the hall to a pretty room over the entrance porch, and provides, amongst other things, room for an orchestra. On the right of the entrance hall are the doctor's consulting rooms, waiting rooms, dressing rooms, and a clerk's office, and on each side of the central hall are the corridors leading to the north and south wings of the building. As these two corridors (ladies' and gentlemen's) are identically the same, a description of one will suffice. The breadth is 10 ft., and lighting on each



CHAMBERS, 71 LAMBTON QUAY, WELLINGTON.

[Thos. Turnbull & Sons, Architects.]

side is provided by windows opening inwards. The floor is red-tiled, and presents a clean and inviting appearance combined with the light walls. At regular intervals along these walls are the doors leading to the private deep and shallow baths, lavatorium and massage establishments. The cost of the new bath house when completed will amount to £26,000, and it should tend to increase the popularity of the famous North Island health resort.



NEW BATH HOUSE AT ROTORUA, TO COST £26,000, NOW IN COURSE OF COMPLETION.

[From the designs of Dr. Wohlmann, Government Balneologist.]